Panic Attacks and Panic Disorder in the Military: Prevalence, Comorbidity, and Impairment

by

Debra Jolene Kinley

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

In partial fulfillment of the requirements of the degree of

MASTER OF ARTS

Department of Psychology

University of Manitoba

Winnipeg

Acknowledgements

This thesis would not have been completed without the help of a number of people. I would like to thank Dr. John R. Walker for his time and effort as my advisor. It has been a pleasure to work with you. Also, to Dr. Jitender Sareen for his mentorship and support and Dr. Corey Mackenzie for his valuable contribution to this research. This research was also assisted by Shay-Lee Belik and Natalie Mota in both statistical and writing consultation. Thank you all for helping make this happen!

This work was supported by a Canadian Graduate Scholarship – Master's from SSHRC and a University of Manitoba Graduate Fellowship – Master's to Jolene Kinley as well as CIHR operating grant #184490 and a CIHR New Investigator Award #152348 to Jitender Sareen. Portions of this work were presented as a poster at the Canadian Psychiatric Association Annual Conference in Vancouver (2008) and as an oral presentation at the Anxiety Disorders Association of America 29th Annual Conference in Santa Ana Pueblo, New Mexico (2009).

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Abstract

Interest in mental health problems in the military has been growing. However, the research to date has focused on posttraumatic stress disorder and depression. This study focuses on panic disorder and panic attacks, which are common, potentially disabling, and associated with a number of other mental health problems. This study is the first to examine panic disorder in detail in the military and extends the literature to include panic attacks, which have never been examined in this population. Using the Canadian Community Health Survey: Canadian Forces Supplement (n=8441), I investigated associations between panic disorder and panic attacks with a wide range of mental and social variables. Panic attacks and panic disorder were both positively associated with reduction of activities, two-week disability, psychological distress, mental disorders, suicidal ideation, and using self-soothing and avoidant coping strategies. These results have important implications for treatment and prevention efforts in the Canadian military.

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Panic Attacks and Panic Disorder in the Military: Prevalence, Comorbidity, and Impairment

Overview

The purpose of the current study is to investigate the prevalence of panic attacks and panic disorder in the Canadian military and to explore a wide range of factors associated with these conditions. Panic disorder is common, potentially disabling, and associated with a number of other mental health problems. Panic attacks have been similarly linked to impairment and other mental health problems. The Canadian Community Health Survey: Canadian Forces Supplement is one of the first surveys that uses a structured interview with a military population and provides the opportunity to consider detailed information concerning panic attacks and panic disorder. This dataset has a wealth of information on sociodemographic variables as well as validated mental health measures.

This thesis is structured into four major sections. The first is a review of the relevant literature as well as the rationale for the proposed study. The second section will provide a detailed description of the survey, variables that were used, and the statistical analyses that were conducted. The third section presents the results of the study. The final section will contain a discussion of the limitations and implications of study.

Background & Rationale

Before one can begin to discuss panic attacks specifically, a more general understanding of anxiety is required. I will focus on why we have anxiety, when anxiety becomes viewed as a problem, and what separates anxiety from depression. I will then briefly review the major theories of anxiety described recently. This will provide enough

of a background to begin to focus specifically on panic attacks and panic disorder, providing a detailed description of each. Finally, I will look at the biological and learned contributions to panic.

Theoretical Perspectives on Anxiety

Anxiety is a natural and functional human experience. Like other emotions, anxiety provides information about the environment and prepares individuals to act in response to environmental stimuli (Kring & Bachorowski, 1999). Most emotions provide information about what is currently happening in the environment. Anxiety is the one emotion that pertains to the future. When a person is experiencing anxiety he or she attends to and processes information differently and is more likely to engage in precautionary behaviours. For example, if a person is anxious about lack of food supply in the future, that person will be more likely to save up food and notice new food sources. These behaviours will make that person more likely to survive in the event that there actually is a food shortage.

Anxiety and the behaviours that anxiety produces are not always beneficial and can sometimes even be detrimental. For example, if an individual is in quicksand the natural response is to escape and the individual will struggle, only getting more and more trapped. In everyday life the detrimental effects of anxiety are most often seen when an individual avoids situations that are important for a productive and happy life because of the anxiety. This point where normal functioning is impeded is when we begin to call anxiety a disorder. The DSM-IV has a number of criteria that must be met to categorize each anxiety problem as a disorder (American Psychiatric Association, 1994). We should remember, however, that someone with one less symptom than meets DSM-IV criteria

for a disorder may experience just as much interference in functioning as someone who fully meets the criteria. Recent research demonstrates that individuals with anxiety symptoms who do not meet full criteria for an anxiety disorder may still have substantial impairment in functioning (Kinley, Cox, Clara, Goodwin, & Sareen, 2009; Marshall et al., 2001; Rucci et al., 2003). Generally these individuals with "subthreshold" anxiety disorders have less impairment than individuals meeting criteria for an anxiety disorder but have more impairment than the rest of the population. This pattern would suggest that anxiety occurs on a continuum with increasing symptoms relating to more impairment. Any threshold we create along the continuum from normal to problematic is arbitrary. Studying anxiety dimensionally rather than categorically has advantages (Kraemer, 2007) and can provide a lot more information than discussing individuals with panic disorder because within this category there is a great deal of variability (Kass, Skodol, Charles, Spitzer, & Williams, 1985).

However, having a threshold may be helpful in order to facilitate research and decision making about the problem (Kessler, 2002). A categorical model can be easier to use because there is not an overwhelming amount of information about different dimensions and variables (Frances, First, & Pincus, 1995). Clinically, decisions need to be categorical in terms of whether or not to provide services and what services are needed. However, different decisions may be best served by different criteria (Kendler, 1990). Both the dimensional and categorical models can have utility for understanding anxiety but the limitations of both also need to be acknowledged in any research and clinical decisions regarding anxiety disorders (Haslam, 2003).

Beginning to look historically at theories of anxiety, one of the first and most prominent theories to capture anxiety was Eysenck's (1967; 1981) theory of personality. The theory relies on two axes, one continuum from introversion to extroversion and one from neurotic to stable. The former is a function of individuals' different optimal levels of arousal, which Eysenck suggests is biologically determined. Introversion represents a lower optimal level of arousal and would be considered one component of anxiety. The second axis is based on differences in reactivity of individuals' autonomic nervous systems. People who are high on neuroticism have intense activation and slow habituation, which is the other component of anxiety.

Gray's (1982; 1985) model moves from continua to systems. This theory is based on three motivation systems: (1) the behavioural inhibition system, (2) the behavioural approach system, and (3) the fight or flight system. Gray believed that for people with high anxiety, the behavioural inhibition system is exaggerated leading to avoidance behaviour. Closely related, Kagan and colleagues (Kagan, 1989; Kagan, Reznick, & Snidman, 1987; Kagan & Snidman, 1991) also used the idea of behavioural inhibition but focused on the idea of temperaments that have a relatively stable biological base and physiological associations. Behavioural inhibition is linked to increased salivary cortisol levels, muscle tension, pupil dilation, and urinary catecholamine levels. Individuals with high behavioural inhibition also tend to have high and stable heart rates and high reactivity of circuits originating in the amygdala. The heritability component of this reactivity is estimated between .3 and .5 (Robinson, Kagan, Reznick, & Corely, 1992; Saudino & Cherny, 2001). Heritability components range from 0 to 1 and represent the

proportion of the variance that heritability can explain. This component will depend on the diversity in the environment as well as the genetic contribution.

Beck and colleagues (Beck, Emery, & Greenberg, 1985; Beck, 1993; Beck & Clark, 1997) began to look at anxiety in terms of cognitions and their role in causing and maintaining anxiety. This theory does not try to explain all anxiety, but only problematic anxiety. People sometimes have irrational or exaggerated beliefs or misinterpretations about the world or their influence on the world. These faulty cognitions lead to a continuous pattern of interpreting stimuli called a schema, which is a mental representation of the world. The schema that anxiety is associated with is that reality, or some aspect of it, is dangerous. For example, a faulty belief may be that anxiety itself is dangerous. If anxiety is dangerous then anything that causes anxiety is dangerous. This belief would cause a person to avoid stimuli that cause anxiety and when anxiety is felt, engage in behaviours to reduce or avoid the feeling itself. Anxiety is most functional for physical threat because the behaviours (i.e., run or fight) can actually reduce the danger. With psychological stimuli the behaviours do not help to reduce the threat and can actually exacerbate the problem.

Some more recent theories have viewed anxiety as an action tendency or a disposition. Izard and colleagues (Izard, 1993; Izard & Youngstrom, 1996) describe emotions as fundamental action tendencies that involve an integration of other response systems (i.e., cognitive, neurological, and behavioural). Lang (1994; 1995) goes further with the notion of action tendencies to the basic information processing involved. These action tendencies can be stored and accessed in different ways based on contextual information processing. All aspects of a memory (e.g., hearing, sight, touch, smell) will

be stored and associated with the action tendency. The way a situation or stimulus is processed will lead to a different response disposition depending on context. The more aspects of a situation that are matched to those that were encoded with the memory the stronger the emotional response will be. For example, when seeing a stimulus that is viewed as frightening, one will feel some fear and the action tendency will be to avoid the stimulus. If one views this stimulus and also hears and smells it, the fear response will be stronger as will the tendency to avoid the stimulus. Anxiety activates the defence motivation that makes one more disposed to avoid or attack.

A current integration of previous theory conceptualizes anxiety as a cognitive-affective structure within the defensive motivation system (Barlow, 2002). At the centre of the structure is a sense of uncontrollability that leads to a preoccupation with possible future threat and is associated with a feeling of helplessness. There is a shift in one's focus to the self and to the possible threat. This attention change can lead to distortions and biases in memories and cognitions. Barlow also describes the physical component, which involves the corticotropin-releasing factor system. The activation of this system contributes to a physiological "readiness" or hypervigilance.

Theoretical Perspectives on Panic Attacks and Panic Disorder

Panic disorder is a serious and common mental disorder characterized by panic attacks that are accompanied by excessive worry about those attacks and their implications, or a change in behaviour due to the attacks. *Panic attacks* are discrete periods of fear or distress with at least 4 symptoms out of a list of 13 common panic symptoms that occur suddenly and reach their peak severity within 10 minutes (American Psychiatric Association, 1994). Different people report different clusters of symptoms

and the symptoms experienced by one person can be different for different attacks. Most people seen in clinical settings who have panic attacks report more than the required four symptoms and most report palpitations (98%), dizziness (95%), trembling (86%), and a fear of dying, going crazy, or losing control (90%; Rapee, Sanderson, McCauley, & DiNardo, 1992). It is the symptom of fear that often differentiates individuals with panic disorder from other anxiety disorders.

Panic attacks are thought to be the clinical expression of fear (Barlow, 2002), which for the purpose of this thesis will be defined as an intense activation of the defensive motivation system (Lang, 1994; Lang, 1995). Fear occurs when we are threatened and it activates physiological changes that will allow the individual to quickly and effectively respond to dangerous stimuli (Barlow, 1991). For example, if a person is threatened on the street fear occurs and causes an increase in adrenaline. This change, along with the urge to either run or fight, can allow that person to either escape the threatening individual or fight off the attacker. People experiencing panic attacks have intense arousal, feel fearful, and have strong urges to escape. These attacks can occur "out of the blue" with no identifiable trigger. With nothing to attribute the fear to, the panic attacks themselves are often viewed as frightening, and situations where they may occur or situations that would be hard to escape in the event of a panic attack are often avoided.

Although we all have anxiety and the capacity to have panic attacks, what accounts for individual differences in the occurrence of panic attacks and panic disorder? In family studies of patients with panic disorder, the prevalence of panic disorder in family members ranges from 7.9% to 41% depending on the population and the

assessment technique (Crowe, Pauls, Slyman, & Noyes, 1980; Crowe, Noyes, Pauls, & Slyman, 1983; Fryer, Mannuzza, Chapman, Martin, & Klein, 1995; Maier, Lichtermann, Minges, Örlein, & Franke, 1993; Mendlewicz, Papadimitriou, & Wilmotte, 1993; Weissman, 1993). The prevalence among control families in these studies never exceeded 8%. The relative risk of panic for family members of a person with panic disorder ranged from 3.3 to 17.7. A challenge with family studies is that the cause of the association could be either genetic, learned, or some combination of the two. One step to exploring these issues is to use twin studies. Twin studies on panic disorder have provided evidence that there is a specific genetic contribution to panic disorder (Carey & Gottesman, 1981; Carey, 1982; Skre, Onstad, Torgersen, Lygren, & Kringlen, 1993). For example, one study found that if the proband had panic disorder then the rate of anxiety disorder with panic in a monozygotic twin was 31% and in a dizygotic twin was 0% (Torgersen, 1983). However, there is also a great deal of research suggesting that genetic vulnerability is more nonspecific and that genetic factors may predispose an individual to all anxiety disorders and other related disorders. The difference in the specific disorder that occurs would be due to environmental differences (Kendler, 1995; Kendler, 1996). This hypothesis is supported by the increasing evidence for polygenic models of heritability for psychological disorders, which means that there is some contribution to genetic vulnerability by a number of different genes (Kendler, 1995; Lesch et al., 1996; Plomin, DeFries, McClearn, & Rutter, 1997). However, fear seems to have a somewhat different heritability from general anxiety (Öst & Hugdahl, 1985) and because of the strong link between fear and panic attacks, there may also be a somewhat different genetic

contribution from other forms of anxiety. Kendler (1995) supported this idea with observations of unique sources of genetic variance for panic.

One mechanism that may link genetic predisposition to panic attacks is anxiety sensitivity. Anxiety sensitivity is a trait-like concern that anxiety and the physical symptoms associated with anxiety are dangerous (Reiss, 1991). Measures of anxiety sensitivity can predict panic attacks (Deacon & Valentiner, 2001; Maller & Reiss, 1992) and high anxiety sensitivity is related to worse outcome in individuals with panic attacks (Telch, Lucas, & Nelson, 1989). Anxiety sensitivity can also predict more general anxiety and depression (Schmidt, Zvolensky, & Maner, 2006). This concept would parallel cognitive theories that panic disorder is maintained by misinterpretation of somatic sensations as harmful (Clark et al., 1997).

Although there is a part of anxiety and panic that is genetic and people may be predisposed to an anxiety disorder including panic disorder, there is also a learned component. The basis for learned anxiety or fear comes from classical conditioning. When a neutral stimulus is paired with a stimulus that causes fear (unconditioned stimulus) repeatedly, that neutral stimulus will begin to cause fear and become a conditioned stimulus (Watson & Raynor, 1920). This process can also occur with other emotions or physical reactions. For example, stimuli such as a smell paired with chemotherapy can induce nausea (Jacobsen et al., 1993; Jacobsen et al., 1995). This pairing can occur through just one trial for traumatic experiences or certain stimuli or it can occur over repeated trials. It is even common for there to be no direct experience with the stimulus as when a fear is developed through modeling (Menzies & Clarke, 1993; Menzies & Clarke, 1995). There are some stimuli that are more likely to become cues for

anxiety because it is adaptive to avoid those stimuli. For example, people who fear heights are less likely to fall to their death so situations involving heights are a "prepared" stimulus for most individuals. For anxiety disorders other than panic disorder conditioning theories have concentrated on the pairing of neutral stimuli with fear or anxiety, which eventually leads to those neutral stimuli triggering anxiety and avoidance of those stimuli (Eysenck & Rachman, 1965). The difference with panic disorder may be that the neutral stimulus that cues the panic response is internal (Barlow, 2002). Physiological arousal or anxiety becomes the conditioned stimulus for the panic response. Extinction of the fear occurs through continual presentation of the conditioned stimulus without the unconditioned stimulus, which is the basis for most anxiety treatments.

Along with the genetic and conditioned contributions to panic disorder, there are certain psychological factors that can increase vulnerability. One of the most important is sense of control. A sense of unpredictability has been linked to anxiety and total uncontrollability to depression, although there can be considerable overlap (Mineka & Zinbarg, 1996; Seligman, 1975). Unpredictability can be influenced by parenting style (Dumas, LaFreniere, & Serketich, 1995) and attribution style (Nolen-Hoeksema, Wolfson, Mumme, & Guskin, 1995). Other factors that influence vulnerability for panic disorder include reinforcement when ill as a child (Whitehead, Winget, Fedoravicius, Wooley, & Blackwell, 1982), chronic illness in household growing up (Ehlers, 1993), and learned sensitivity to specific symptoms such as respiratory distress (Tsao & Craske, 2000).

Any of these contributing factors (i.e., genetic, conditioning, psychological) will not necessarily lead to panic disorder. In most cases it is likely an interaction between the

different factors that lead to panic disorder. Like other mental disorders, panic disorder may be understood in the diathesis-stress model where there are underlying vulnerabilities (e.g., genetics, attribution style) that when combined with some type of stress may lead to the development of a disorder (Barlow, 2002).

Panic Disorder and Panic Attacks: The Research

Lifetime prevalence estimates for panic disorder from American and Canadian data range from 2 to 5% in the general population (Kessler et al., 2006; Roy-Byrne et al., 2000) and past-year prevalence estimates range from 1.7 to 2.8% (Kessler et al., 2006; Kinley et al., 2009). These rates are relatively consistent across countries and cultures, with the exception of Taiwan, which has lower rates (Weissman et al., 1997). Panic disorder has been associated with increased comorbidity with other mental disorders (Bovasso & Eaton, 1999; Dick, Bland, & Newman, 1994; Kinley et al., 2009), suicidal ideation (Goodwin et al., 2001; Kinley et al., 2009), and negative life events such as illness, bereavement, and legal problems (Cramer, Torgersen, & Kringlen, 2005). Importantly, panic disorder has also been shown to be associated with decreased quality of life, reduced contact with friends and family, and reduced social support (Cramer et al., 2005; Katerndahl & Realini, 1997; Rubin et al., 2000; Markowitz, Weissmen, Ouellett, Lish, & Klerman, 1989). For example, one study found that persons with panic disorder lost on average 39 quality adjusted days for each year that they lived with the disorder based on the Quality of Well-Being Scale that can be described in terms of quality adjusted life-years (Rubin et al., 2000).

Not all people with panic attacks have panic disorder and there has been extensive research on the factors associated with panic attacks. The prevalence of panic

attacks is higher than full blown panic disorder with lifetime prevalence estimates ranging from 6 to 23% (Baillie & Rapee, 2005; Kessler et al., 2006) and 12-month prevalence rates of approximately 3 to 6.4% (Baillie & Rapee, 2005; Kinley et al., 2009; Marshall, Zvolensky, Sachs-Ericsson, Schmidt, & Bernstein, 2008). This anxiety experience is more common in females (Deacon & Valentiner, 2000) and in people with lower income (Katerndahl & Realini, 1997), lower education (Katon et al., 1995), and increased financial dependency (Klerman, Weissman, Ouellette, Johnson, & Greenwald, 1991). The presence of panic attacks has been linked to higher rates of comorbidity with a wide range of mental disorders, including mood and anxiety disorders (Baillie & Rapee, 2005; Bovasso & Eaton, 1999; Goodwin & Gotlib, 2004; Goodwin & Hamilton, 2001; Reed & Wittchen, 1998), substance use disorders (Bernstein, Zvolensky, Sachs-Ericsson, Schmidt, & Bonn-Miller, 2006), psychotic disorders (Goodwin, Fergusson, & Horwood, 2004), and personality disorders (Goodwin, Brook, & Cohen, 2005). The relationship of panic attacks with depression, substance use disorders, and other anxiety disorders appears to be independent of the effects of gender, neuroticism and other anxiety disorders (Baillie & Rapee, 2005). Some of these studies have even been longitudinal with time one panic attacks predicting time two psychopathology (Goodwin et al., 2005; Goodwin et al., 2004). In one cross-sectional study, people who had been treated for panic attacks were less likely to have depression than those whose panic attacks went untreated (Goodwin & Olfsen, 2001).

Related to other aspects of psychopathology, associations have been found between panic attacks and suicidal thoughts and behaviours (Goodwin & Hamilton, 2002; Goodwin et al., 2001; Kinley et al., 2009; Woodruff-Borden, Stanley, Lister, & Tabacchi,

1997). Physical health problems such as hay fever (Goodwin, 2002), asthma (Goodwin, Pine, & Hoven, 2003), and the presence of any medical condition (Kinley et al., 2009) occur more frequently in people with panic attacks and these individuals have lower perceived physical functioning and health (Marshall et al., 2008). Persons with panic attacks also have higher rates of disability and unemployment (Katerndahl & Realini, 1997; Kessler et al., 2006; Marshall et al., 2008) and reduced quality of life (Katerndahl & Realini, 1997). Katon and colleagues (1995) even found similar levels of disability in people with panic attacks compared to people with panic disorder in terms of social, family, and vocational functioning. Disability was assessed in terms of physical functioning, mental health, role impairment, days in bed due to health problems, and reduction of activities.

Mental Disorders in the Military

The military plays an important role in the operation of our society. In order to do their work properly, military personnel have to be in good mental and physical health. However, this population may be exposed to a high frequency of stressful life events that are often associated with mental health problems. Better understanding the mental health of this population could lead to better screening and more effective prevention and treatment of mental health problems in the military. All of the studies discussed below are based on US military samples unless otherwise stated.

Within the military, mental health problems are related to attrition (Hoge, Aucherlonie, & Milliken, 2006) and physical health problems such as fibromyalgia, asthma, injuries, and cardiac and gastrointestinal diseases (Black et al., 2004; Pizarro, Silver, & Prause, 2006). Symptoms of mental disorders, such as impaired concentration

and memory, could negatively affect an individual's ability to do his or her job safely and effectively, which in the military could endanger the individual, his or her comrades, and civilians (Institute of National Academies, 2000). In a ten-year study of military personnel, mental disorders were a significant cause of hospitalization and accounted for a larger percent of hospitalizations as the study continued (Hoge et al., 2002). Service members who were hospitalized for mental disorders had higher rates of attrition from the military than those hospitalized for other health problems. Mental disorders were involved in 13% of all hospitalizations and accounted for almost 25% of all inpatient bed days (Hoge et al., 2002). The most common mental disorders were alcohol and substance use disorders, adjustment disorders, mood disorders, and personality disorders.

During deployment, military personnel often experience traumatic events that could affect their mental health (Bransen, Dirkzwager, & Ploeg, 2000; Clancy et al., 2006). Deployment has been linked to increased distress (Engelhard et al., 2007), confusion and tension (Vasterling et al., 2006), physical disease (Pizarro et al., 2006), and mental disorders (Hoge et al., 2004). A study using Canadian data has supported the association between deployment and mental disorders and also found increased perceived need for mental health care among individuals who had been deployed (Sareen et al., 2007). Combat exposure in particular is associated with higher rates of PTSD, depression, substance abuse, unemployment, job loss, divorce or separation, and spouse or partner abuse (Prigerson, Maciejewski, & Rosenheck, 2002; Dirkzwager, Bramsen, & Ploeg, 2005). Combat has also been linked to mental health problems in Canadian peacekeepers (Sareen et al., 2007; Sareen et al., 2008). US soldiers and marines who served in Iraq reported higher rates of combat experience and greater frequency of contact with the

enemy than those who served in Afghanistan. Those serving in Iraq were more likely to: (a) report current mental health problems, (b) report more interest in receiving help, and (c) use mental health services than soldiers who were not deployed and those who served in Afghanistan (Hoge et al., 2004). With PTSD, a positive dose-response relationship with combat experiences has been reported (Clancy et al., 2006; Dohrenwend et al., 2006; Hoge et al., 2004), with increasing levels of combat experience related to higher rates of PTSD. One of the major stressors during deployment is witnessing atrocities (Bartone, Adler, & Vaitkus, 1998; Litz, King, King, Orsillo, & Friedman, 1997), which is associated with most mental disorders, perceived need for mental health care, and long-term restriction of activities (Sareen et al., 2007).

One potentially protective factor is style of coping behaviour. How an individual handles stressful situations and traumatic experiences can vary tremendously across individuals and situations ranging from withdrawing from others, to drinking, to talking to others. An active coping style (e.g., talking to others, problem solving) as opposed to a passive style, moderated the effect of work stress on psychological symptoms in one longitudinal study of US peacekeepers (Ippolito, Adler, Thomas, Litz, & Holzl, 2005). Problem-focused coping behaviour was also associated with a lower likelihood of PTSD in a study of former Dutch peacekeepers (Dirkzwager, Bramsen, & Ploeg, 2003) and in a UK sample talking about military experiences was associated with lower distress (Greenberg et al., 2003).

Most of the current research on mental disorders in the military has focused on PTSD and depression. Both disorders occur at higher rates following deployment and are associated with severe impairment (Cabrera, Hoge, Bliese, & Castro, 2007). This

research has been very important for our understanding of mental disorders in the military. One study focusing on factors contributing to PTSD found that premilitary factors (e.g., genetic vulnerability, personality, childhood experiences) contributed 10% of the variance, military factors (e.g., combat experiences, rank) contributed 19% of the variance, and postmilitary factors (e.g., support, traumas in civilian life) contributed 12% (Green, Grace, Lindy, Gleser, & Leonard, 1990).

The limited studies on other mental disorders in the military include prevalence estimates and associations with sociodemographic and deployment variables. Killgore, Stetz, Castro, and Hoge (2006) reported that 15% of the military met criteria for an anxiety disorder (other than PTSD) but Hoge and colleagues (2004) did not find an increase in non-PTSD anxiety after deployment. Hughes and colleagues (2005) even found a highly significant relative improvement in mental health after deployment. However, the dropouts from the study may not have been random, possibly leading to a bias towards those who were mentally healthy still being in the study at the final follow-up. At time one there were 733 participants and at time two there were only 254 of the original participants.

The extant literature on panic disorder in the military is even more limited. Although panic disorder may not be as uniquely associated with the military as PTSD has been, it is a common disorder that often appears after stressful life events. Riddle and colleagues (2007) reported a past month prevalence rate of 1% for panic disorder as well as prevalence rates broken down by sociodemographic variables. Individuals with a bachelor's degree or higher, combat specialists, reserve personnel, men, and black individuals were less likely to have panic disorder (Riddle et al., 2007). Black and

colleges (2004) reported a past month prevalence rate of 2.8% for Gulf War veterans and 1.3% for non-Gulf War veterans. Participation in combat was a risk factor for panic disorder as well as other anxiety disorders.

Another area that has not been explored thoroughly but is important in terms of allocation of resources is the area of perceived need for mental health care and utilization of available services. The health care system for the military is different from the general population and there may be different needs. Perceived need for and utilization of mental health services may also have different correlates between military and civilian populations. There are different values and expectations in the military. Being "strong" is extremely important and this population may feel more shame over perceived weakness (J. Laforce, personal communication, May 6, 2009). If having a mental health problem or seeking help for such a problem is viewed as weak this could be a major barrier to seeking help. In support of this hypothesis, Hoge et al. (2004) found that in the US military, the most endorsed perceived barriers to care were those that were attitudinal such as "members of my unit might have less confidence in me" or "I would be seen as weak" rather than structural such as "I don't have adequate transportation" or "mental health care costs too much money". Relatively similar rates of perceived need and service use have been found in the military when compared to the general population, however they are still quite low and treatment may be especially important to this population. In one study of military personnel, approximately 40% of those individuals meeting screening criteria for a mental disorder were interested in getting help and of those individuals, only 20-40% had received help in the past-year (Hoge et al., 2004). In the Canadian military, 14.9% met criteria for any past-year mental disorder (Sareen et al.,

2007). Of those, 59.8% had a self-perceived need for care according to the Perceived Need for Care Questionnaire (PNCQ). However, only 21.6% of individuals with a past-year diagnosis had their needs fully met. Another 25.4% has a partially met need for mental health care. Using the same questionnaire in the Australian general population, 61.2% of those suffering from a mental disorder had perceived a need for help (Meadows et al., 2002). A study using data from a US nationally representative survey (the National Comorbidity Survey Replication) reported that approximately 40% of individuals with a past-year mental disorder received mental health services (Druss et al., 2007). Perceived need also varies by mental disorder, with panic disorder having the highest rates of perceived need (Meadows et al., 2002). The higher rates may be the result of the strong physical symptoms commonly experienced during panic attacks leading to a large number of those with panic attacks presenting to the emergency room fearing that they are having a heart attack or some other serious medical problem.

The Current Study

Despite increasing support for the association between deployment and mental health problems in the military, there are a number of areas that have not been explored in previous studies. First, there are various other factors both pre- and post-deployment that may contribute to the risk for mental health problems (Green et al., 1990) but are often not included in analyses such as notice prior to deployment, family concerns over deployment, stress coping style, and role impairment. Second, the majority of studies to date have used self-report measures for assessing mental disorders as opposed to structured interviews, possibly overestimating the prevalence of some disorders (Engelhard et al., 2007). Third, most of the recent research involves the US military

(Black et al., 2004; Cabrera et al., 2007; Clancy et al., 2006). There have also been some military studies with UK (Browne et al., 2007; Hughes et al., 2005) and Dutch (Engelhard et al., 2007) samples. These findings may not generalize to the Canadian military because in recent years, until the Afghanistan deployment, most Canadian soldiers were involved in peacekeeping operations, military selection criteria across countries are different, and the severity of combat exposure may not be comparable. Finally, the research focusing on panic disorder in the military is limited and has not included the study of panic attacks in persons without panic disorder.

I sought to overcome these limitations by using the Canadian Community Health Survey – Canadian Forces Supplement (CCHS-CFS), a large dataset with an abundance of information using a structured clinical interview and validated measures (e.g., Sheehan Disability Scale, K10 Distress Scale). This survey allowed for exploration of correlates of panic disorder and related phenomena within the military. Using this large representative sample, this project extends the research on panic disorder in the military to Canadian military personnel, as well as broadening the range of variables considered.

The hypotheses were:

(1) that the prevalence of panic attacks and panic disorder will be higher among military personnel who:

   a. have experienced deployment
   b. have experienced combat
   c. are regular personnel as opposed to reserve personnel
   d. are single, widowed, or divorced
   e. have lower income

f. have lower education

(2) that compared to individuals without panic attacks, persons with panic attacks and panic disorder will have higher rates of

a. mental disorders

b. disability

c. impairment

d. avoidant and self-soothing coping skills

(3) that compared to individuals with panic attacks, persons with panic disorder will have higher rates of mental disorders, disability, impairment, and avoidant and self-soothing coping skills

(4) that perceived need for mental health care and mental health service use will be higher in individuals with panic disorder than those with panic attacks without panic disorder

Methods

Canadian Community Health Survey – Canadian Forces Supplement

The CCHS-CFS was carried out by Statistics Canada and the Department of National Defence using a multistage sampling framework to allow for representativeness of the sample with respect to the Canadian military (Statistics Canada, 2002). The first stage of sampling involved dividing the sample by regular versus reserve status, then stratifying by rank and sex. For males the rank categories were junior (private, corporal, and master corporal), senior (sergeant, warrant officer, master warrant officer, and chief warrant officer), and officer (officer cadet, second lieutenant, lieutenant, captain, and major). The senior and officer groups were combined for females because of small cell

sizes. The sample was further broken down by region (Atlantic, Quebec, Ontario, and Prairies) and Canadian Forces environment (air, land, sea, and communications). Face-to-face interviews conducted by trained Statistics Canada interviewers were used to collect data in private on-base rooms between May 1 and December 31, 2002. The sample was made up of 5155 regular force members (response rate, 79.5%) and 3286 reserve force members (response rate, 83.5%; Statistics Canada, 2009).

Panic Attacks and Panic Disorder

To assess panic attacks and panic disorder, two screener questions were asked: (1) "During your life, have you ever had an attack of fear or panic when all of a sudden you felt very frightened, anxious or uneasy?" (2) "Have you ever had an attack when all of a sudden you became very uncomfortable, you either became short of breath, dizzy, nauseous or your heart pounded, or you thought that you might lose control, die or go crazy?" Respondents who positively endorsed either of these questions completed the panic disorder module. For this survey, the criteria for panic attacks included: discrete periods of intense fear or discomfort accompanied by four or more physiological symptoms (see DSM-IV criteria from Appendix A) that develop abruptly and peak within ten minutes of their onset. Individuals meeting criteria for panic disorder reported recurrent unexpected panic attacks followed by at least one month of worry about additional attacks, worry about the implications of the attacks, or a change in behaviour related to the attacks. Three mutually exclusive categories were created: no panic attacks, panic attacks without panic disorder, and panic disorder.

Characteristics of Panic Attacks and Related Severity

I calculated past-year prevalence rates for persons who experienced panic attacks and panic disorder. Supplemental questions for persons with panic attacks included: age of onset for panic attacks, number of years with at least one attack, number of uncued panic attacks (lifetime and past-year), and number of cued panic attacks (lifetime and past-year). For number of uncued attacks, respondents were asked "about how many attacks occurred unexpectedly, 'out of the blue'?" For cued attacks, respondents were asked "about how many attacks occurred in situations where you were not in real danger, but where you had an unreasonably strong fear of the situations?" These variables were examined as continuous variables and group means were compared.

The Sheehan Disability Scale (SDS; Leon, Shear, Portera, & Klerman, 1992) was used to assess role impairment and was administered to respondents who reported at least one uncued panic attack. This measure consists of questions about home, work, school, social life, and personal relationship impairment. Responses were rated on a scale from 0 to 10. In previous research, responses have been grouped as none (0), mild (1 to 3), moderate (4 to 6), severe (7 to 9), and very severe (10). An overall score was also created by taking the highest score across the questions and collapsing the severe and very severe categories (Kessler et al., 2006). Due to small cell sizes for certain ratings, I dichotomized these variables into not severe (0-6) and severe (7-10) impairment and the school variable could not be reported because few respondents were participating in full time educational activities. By maintaining consistency with epidemiological work that has used the SDS we can better compare the findings to the extant literature. Individuals

were only given the SDS if they met criteria for an unexpected panic attack, making it impossible to look at these variables in those without panic attacks.

To quantify the level of role impairment/disability, I considered the response to the following question as a continuous variable: "In the past 12 months, about how many days out of 365 were you totally unable to work or carry out your normal activities because of your attacks or the worry about the attacks?"

Sociodemographic and Military Variables

Sociodemographic variables were assessed categorically and included age (16-24, 25-34, 35-44, and 45+), sex (male and female), marital status (married, never married, and separated, widowed, or divorced), education (bachelor's degree or higher, any post secondary, and high school or less), and income (≤$39 999, $40 000 – 79 000, $80 000 – 119 000, ≥$120 000).

Military variables included regular or reserve status, military rank (junior, senior, or officer), military environment (land, air, sea, and communications), number of deployments (none, one or more), combat experience (yes or no), and witnessed atrocities (yes or no). Deployment was defined in the CCHS-CFS as "deployed in support of a mission, such as a NATO mission or a UN tour. These deployments must be of at least 3 months duration. Do not include exercises, sea time, individual or collective training courses, TD (temporary duty), aid to civil power activities or Canadian disaster relief activities."

Mental Health Variables

Diagnoses were created using the World Mental Health Comprehensive International Diagnostic Interview (CIDI Version 2.1; Kessler & Ustun, 2004) based on

criteria of the DSM-IV (American Psychiatric Association, 1994). The CIDI is a structured instrument designed for use by lay interviewers (Bijl et al., 2003) that has high levels of reliability and consistency with clinician-based diagnoses (Kessler et al., 1997). The interviewers were trained according to World Mental Health Study standards. Training consisted of a 40-hour self-study module and self-administered tests, as well as a 3-day training workshop at the CIDI Training and Research Centre. Individuals who successfully completed the training participated in the CCHS. Details of the methods of the World Mental Health CIDI (Kessler & Ustun, 2004) and the CCHS (Gravel & Béland, 2005) have been published elsewhere. Diagnoses for the following past-year mental disorders were assessed in the CCHS-CFS: major depressive disorder, panic disorder, social anxiety disorder, generalized anxiety disorder, and PTSD. Alcohol use disorders were assessed with the CIDI Short Form based on DSM-IV criteria, with 3 or more symptoms indicating alcohol dependence (Walters, Kessler, Nelson, & Mroczek, 2008). Other substance use disorders were not assessed because substance use is not permitted in the military. Past-year prevalence was used as opposed to lifetime prevalence because lifetime prevalence obtained on surveys has been shown to underestimate actual lifetime prevalence, sometimes quite drastically (Patten, 2003).

Suicidal Ideation Variable

Past-year suicidal ideation was assessed with the question “Did you seriously think about committing suicide or taking your own life?” I examined only ideation in this study because the past-year prevalence of suicide attempts was too low to be reported as per Statistics Canada regulations for the protection of confidentiality of respondents.

Restriction of Activities, Two-Week Disability, and Distress

To determine severity of impairment across different areas of functioning, I used measures assessing restriction of activity, two-week disability, and distress. For restriction of activity, interviewees were asked "Does a long-term physical health condition or mental health condition or health problem, reduce the amount or kind of activity you can do:" (1) "at home," (2) "at school," (3) "at work," or (4) "in other activities, for example, transportation or leisure." For each of the areas of reduced functioning, the respondent had the choice of (1) sometimes, (2) often, or (3) never. Because of the skewed distribution of this variable, with 72.7% of the sample reporting "never" for all areas of functioning, I dichotomized the variable. Respondents indicating "never" for all areas of functioning were categorized as "no restriction" and respondents reporting some restriction in at least one of these areas were categorized as "some restriction". Individual areas of restriction could not be reported due to small cell sizes. Two-week disability was assessed by the questions "during that period did you stay in bed at all because of illness or injury, including any nights spent as a patient in a hospital?"

The Psychological Distress Scale (K10; Kessler et al., 2002) assessed respondents' level of distress over the past month. The scale ranges from 0 to 40, with higher scores representing more psychological distress. I used one standard deviation above the mean as the cut point for high levels of psychological distress and dichotomized the variable into high versus normal levels of distress.

Deployment Related Variables

To assess notice before deployment (i.e., the amount of time that the individual had to prepare for deployment) respondents were asked "thinking about your most recent deployment, how much notice did you receive prior to deployment?" (responses were: less than a month, between 1 and 3 months, between 4 and 6 months, or more than 6 months). For family concern the question used was "did your immediate family express any concerns regarding this deployment?" If the respondent answered yes, the following question was asked "Which of the following concerns were expressed? 1) Your safety, 2) Lack of quality time, 3) Absence from family home, 4) Care or discipline of children during your absence, 5) Financial affairs, 6) Difficulty managing daily chores, 7) Negative impact on significant relationships, 8) Any other concerns". To assess time away from home, I used the question "During the past 2 years, how many months did you spend away from your home because of deployment and/or exercises, sea time, individual or collective training courses, temporary duty, aid to civil power activities, or Canadian disaster relief activities?" This variable was dichotomized into 0-6 months and 7 or more months based on the distribution of the variable and the recommendation of the Canadian Forces that deployments be no longer than 6 months.

Social Support

The Medical Outcomes Study Social Support Survey (MOS-SS) scales were used to consider social support. There are 19 individual items that measure four different aspects of social support. The four aspects are emotional, informational, tangible, and affectionate support (Sherbourne & Stewart, 1991). For each item, the respondent was asked whether that support was available to them (1) a little of the time, (2) some of the

time, (3) most of the time, or (4) all of the time. For each scale the responses are summed and averaged to get a score for each aspect of support. Scores were then dichotomized into that type of social support available most or all of the time and some or little of the time because cells for the four categories were small and the total scale score distribution was not normal and the categorical analysis appeals to our understanding of social support more so than a normalized linear analysis.

Stress Coping

In addition to these variables, I examined a stress coping scale that was developed by Statistics Canada for the CCHS. This scale was based on the Coping Strategy Indicator (Amirkhan, 1990) and the COPE scale (Carver, Scheier, & Weintraub, 1989) and includes 14 items that evaluate three different styles of coping: avoidant (avoid people, sleep more/less, eat more/less, blame self, wishing situation would go away), active (problem solving, talking to others, jog/exercise, do something enjoyable, look on bright side), and self-soothing (smoke more, drink alcohol, use drugs or medication, praying/spiritual help). These three different styles of coping were determined by a factor analysis by Graff and colleagues (In Press). Ratings for each strategy are made on a 4-point scale from 'never' to 'often'. I examined each individual item in terms of the percentage of individuals that reported using that coping strategy often and examined the scales by comparing mean scores derived from linear regression analyses using t-tests. This method is consistent with Graff and colleagues (Graff et al., In Press).

Perceived Need for Mental Health Care

Perceived need was assessed using the Perceived Need for Care Questionnaire (PNCQ; Meadows, Bobevski, Fossey, & Harvey, 2000), which has demonstrated

acceptable reliability and validity and has been previously used to assess self-reported need for treatment in clinical and community samples (Meadows et al., 2000). The PNCQ assessed perceived need and received help for problems with emotions, mental health, or use of alcohol or drugs in the past-year over five different areas: (1) information about mental health problems, (2) medication, (3) therapy or counselling, (4) social intervention (i.e., help for financial or housing problems), and (5) skills training (for employment issues or personal relationships). Due to disclosure issues with small cell sizes, I created an "all perceived needs" variable by combining responses from the 5 areas. The variable was dichotomized into any perceived need versus none because of the non-normal distribution and to remain consistent with previous research (Sareen et al., 2007).

Mental Health Service Use

All respondents were asked whether or not they had seen or talked to a professional about their emotions, mental health, or use of alcohol or drugs in the past 12 months. I looked at overall service use as well as service use up by the type of professionals including a psychiatrist, family physician/general practitioner, other medical doctor (e.g., cardiologist), psychologist, nurse/nurse practitioner/physician's assistant/medic, social worker/counsellor/psychotherapist, spiritual advisor, or other professional (e.g., acupuncturist, chiropractor). Due to small cell sizes, the other professional category cannot be reported.

In addition to questions about past-year mental health service use, respondents with panic attacks were also asked about lifetime service use for their attacks. They were asked whether they ever saw or talked to a medical doctor or other professional about their attacks, whether they received treatment for the attacks that they considered helpful

or effective, how many professionals they saw or talked to before they got helpful treatment, and how many professionals in total they ever saw or talked to about the attacks. The question about number of professionals seen was examined as a continuous variable and treatment seeking was also examined as a dichotomous variable (present/absent).

Analyses

For all analyses I used two estimation procedures in accordance with Statistics Canada recommendations (Bailie, Dufour, & Hamel, 2002). To ensure the representativeness of the data to the general military population I utilized the appropriate statistical weight provided by Statistics Canada. Next, I carried out design-based variance estimation to reflect the complex multi-stage sampling design of the CCHS-CFS using the bootstrapping method recommended by Statistics Canada (Bailie et al., 2002).

I examined weighted percentages across the variables of interest. For categorical variables, multivariate logistic and multinomial regression analyses assessed relationships with panic attack status, the independent variable (no panic attack, panic attack, and panic disorder). Regressions for sociodemographic variables, deployment related variables, mental disorders, suicidal ideation, restriction of activity, two-week disability, distress, social support, and stress coping were run once with the "no panic attack" group as the reference group and once with the "panic attack" group as the reference group so we could directly compare people with panic attacks to people with panic disorder. For analyses exploring variables directly related to panic attacks, perceived need, and mental health service use logistic regressions were run with the "panic attack" group as the reference group. For continuous variables I used linear regression analyses to obtain

adjusted mean scores to assess differences between the panic attack and panic disorder groups. The means were compared using t-tests.

All odds ratios are presented with 95% confidence intervals. All statistical analyses were conducted using the CCHS-CFS data accessed through the Statistics Canada Research Data Centre in Winnipeg.

Results

Prevalence of Panic Attacks and Panic Disorder

For lifetime panic, 157 individuals had missing data. Of the remaining sample, 6320 (76.4%) people had never experienced a panic attack, 1693 (20.0%) people had at least one panic attack in their lifetime without meeting the criteria for panic disorder, and 271 (3.4%) people met the criteria for panic disorder at some time in their life. There were 173 individuals missing for past-year panic variables and who were excluded from the analyses. In the past 12 months 7562 (91.3%) people did not have a panic attack without meeting the criteria for panic disorder, 569 (7.0%) had at least one attack, and 137 (1.8%) met criteria for panic disorder.

Sociodemographic and Military Variables

Table 1 describes the sociodemographic variables across the different panic categories and the odds ratios associated with the logistic regression analyses, and the analyses associated with the military variables are presented in Tables 2. Panic attacks and panic disorder were significantly associated with being female, less educated, rank below officer level, and having witnessed atrocities. Panic disorder was also associated with increased odds of being separated, widowed, or divorced, regular military status, and combat experience. When comparing the panic attack and panic disorder group the only

significant differences were with age, income, and regular status. I will now present some prevalence estimates for panic attacks in the different groupings to compare to the overall sample past-year prevalence of 7%. The prevalence of panic attacks was highest among females (10%) and lowest among people with a bachelor's degree or more education (4.6%). Another notable high prevalence was among those who were never married with 9.1% of this group reporting panic attacks. Another low was 5.4% of individuals 45 years or older reporting panic attacks. Similarly, compared to the sample past-year prevalence for panic disorder of 1.8%, there were higher prevalence estimates for individuals who had never married (3.9%) and for females (2.6%). Lower prevalence estimates were seen in individuals with a household income of $39 999 or less (1.0%) and $120 000 or more (1.1%), individuals between the ages of 16 and 24 (1.0%), and individuals with a bachelor's degree or higher education (1.2%). The composition of the whole sample is presented in detail elsewhere (Sareen et al., 2007).

Table 1: Sociodemographic Variables Related to Past-Year Panic Attacks and Panic Disorder

	No Panic Attacks N = 7562 %	**Panic Attacks** N = 569 %	**Panic Disorder** N = 137 %	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 1: Odds Ratios (95% CI) from Binary Logistic and Multinomial Regressions		
Sex						
Male	85.8%	78.7%	78.3%	1.0	1.0	1.0
Female	14.2%	21.3%	21.7%	1.6 (1.4 – 2.0)**	1.7 (1.2 – 2.4)**	0.9 (0.7 – 1.5)
Age						
16-24	19.4%	23.1%	11.0%	1.0	1.0	1.0
25-34	30.7%	31.8%	34.3%	0.9 (0.7 – 1.1)	2.0 (1.0 – 4.1)	2.3 (1.0 – 4.9)*
35-44	37.3%	35.5%	41.7%	0.8 (0.6 – 1.0)	2.0 (1.0 – 4.0)	2.5 (1.2 – 5.2)*
45+	12.7%	9.5%	13.0%	0.6 (0.4 – 0.9)**	1.8 (0.8 – 3.8)	2.9 (1.3 – 6.5)*
Marital Status						
Married	63.1%	60.5%	60.8%	1.0	1.0	1.0
Separated/ Widowed/ Divorced	7.0%	9.5%	16.4%	1.4 (1.0 – 2.0)	2.4 (1.4 – 4.3)**	1.7 (0.9 – 3.4)
Never Married	29.9%	30.0%	22.8%	0.9 (0.8 – 1.3)	0.8 (0.5 – 1.3)	1.8 (0.4 – 1.3)
Income						
$120 000+	9.9%	11.1%	6.2%	1.0	1.0	1.0
$80 0000 – 119 999	30.2%	28.0%	36.6%	0.8 (0.6 – 1.1)	1.9 (1.1 – 3.5)*	2.4 (1.2 – 4.6)*
$40 000 – 79 999	49.2%	50.4%	51.5%	0.9 (0.7 – 1.2)	1.7 (0.9 – 3.0)	1.9 (0.9 – 3.5)
$39 999 or less	10.8%	10.8%	5.7%	0.9 (0.6 – 1.4)	0.9 (0.3 – 2.2)	0.9 (0.3 – 2.7)
Education						
≥Bachelor's	18.4%	11.9%	12.0 %	1.0	1.0	1.0
Any post secondary	30.0 %	33.5 %	27.6 %	1.7 (1.3 – 2.3)**	1.4 (0.8 – 2.5)	0.8 (0.4 – 1.5)
≤High school	51.6 %	54.7 %	60.4 %	1.6 (1.3 – 2.1)**	1.8 (1.1 – 3.0)*	1.1 (0.6 – 2.0)

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval. N is unweighted and percentages are weighted.

Table 2: Military Variables Related to Past-Year Panic Attacks and Panic Disorder

	No Panic Attacks N = 7562 %	**Panic Attacks** N = 569 %	**Panic Disorder** N = 137 %	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 1: Odds Ratios (95% CI) from Binary Logistic and Multinomial Regressions		
Military Rank						
Junior	59.7%	68.3%	70.1%	1.7 (1.4 – 2.2)**	3.0 (1.8 – 5.2)**	1.7 (1.0 – 3.1)
Senior	20.1%	17.9%	21.8%	1.3 (1.0 – 1.8)*	2.8 (1.6 – 5.0)**	2.1 (1.1 – 3.8)*
Officer	20.7%	13.7%	8.1%	1.0	1.0	1.0
Military Status						
Regular	70.7 %	68.7 %	79.5 %	0.9 (0.8 – 1.1)	1.6 (1.1 – 2.4)*	1.8 (1.1 – 2.8)*
Reserve	29.3 %	31.3 %	20.5 %	1.0	1.0	1.0
Environment						
Land	56.1 %	58.7 %	51.1 %	1.0	1.0	1.0
Air	25.1 %	19.6 %	26.1 %	0.7 (0.6 – 1.0)*	1.1 (0.7 – 1.8)	1.5 (0.9 – 2.5)
Sea	16.9 %	19.9 %	18.6 %	1.1 (0.9 – 1.5)	1.2 (0.7 – 2.1)	1.1 (0.6 – 2.0)
Communications	1.9 %	26.9 %	4.2 %	0.9 (0.5 – 1.7)	2.4 (0.9 – 6.6)	2.6 (0.9 – 8.0)
Deployments						
0	50.7 %	50.3 %	43.4 %	1.0	1.0	1.0
1 or more	49.3%	49.7%	56.6%	1.0 (0.8 – 1.2)	1.3 (0.9 – 2.0)	1.3 (0.9 – 2.0)
Combat						
No	84.4%	81.3%	74.1%	1.0	1.0	1.0
Yes	15.6%	18.7%	25.9%	1.2 (0.9 – 1.7)	1.9 (1.2 – 3.0)*	1.5 (0.9 – 2.5)
Witnessed Atrocities						
No	87.8%	82.2%	75.5%	1.0	1.0	1.0
Yes	12.2%	17.8%	24.5%	1.6 (1.2 – 2.1)**	2.4 (1.5 – 3.7)**	1.5 (0.9 – 2.5)

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval. N is unweighted and percentages are weighted.

Variables Related to Deployment

Individuals with panic attacks and panic disorder were similar to individuals without panic attacks on most deployment related variables as shown in Table 3. Both groups reported more family concern over deployment, individuals with panic attacks reported more family concern over daily chores, and individuals with panic attacks reported more family concern over finances than individuals without panic attacks. For individuals from all groups that reported family concern over deployment, the most common concern was safety and then absence from the family home.

Table 3: Deployment Variables Related to Past-Year Panic Attacks and Panic Disorder

	No Panic Attacks N = 7562 %	**Panic Attacks** N = 569 %	**Panic Disorder** N = 137 %	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables		
7 +Months Away From Home (Past 2 Years)	29.5%	32.1%	21.2%	1.1 (0.9 – 1.4)	0.7 (0.4 – 1.1)	0.6 (0.3 – 0.9)*
< 12 Months Between Deployments	9.7%	7.2%	12.8%	0.7 (0.5 – 1.1)	1.4 (0.7 – 2.5)	1.9 (0.9 – 3.8)
Notice Before Last Deployment						
< 1 month	21.8%	23.0%	18.8%	1.2 (0.8 – 1.9)	0.7 (0.3 – 1.5)	0.6 (0.2 – 1.4)
1 – 3 months	31.0%	32.8%	30.7%	1.2 (0.8 – 1.9)	0.8 (0.4 – 1.5)	0.6 (0.3 – 1.4)
4 – 6 months	25.6%	25.4%	23.0%	1.1 (0.7 – 1.8)	0.7 (0.3 – 1.6)	0.6 (0.3 – 1.5)
> 6 months	21.5%	18.8%	27.5%	1.00	1.00	1.00
Family Concern Over Deployment	59.5%	67.3%	74.2%	1.4 (1.0 – 1.9)*	2.0 (1.0 – 3.8)*	1.7 (0.7 – 2.8)
Concern Over:†						
Safety	83.8%	84.6%	84.4%	1.1 (0.6 – 1.8)	1.1 (0.4 – 2.7)	1.0 (0.3 – 2.9)
Lack of Quality Time	39.8%	46.7%	43.4%	1.3 (0.9 – 2.0)	1.2 (0.6 – 2.2)	0.9 (0.4 – 1.8)
Absence from Home	68.4%	65.9%	73.0%	0.9 (0.6 – 1.3)	1.3 (0.6 – 2.5)	1.4 (0.6 – 3.1)
Care of Children	25.3%	32.0%	28.5%	1.4 (0.9 – 2.1)	1.2 (0.6 – 2.4)	0.9 (0.4 – 1.9)
Finances	14.2%	20.1%	29.0%	1.5 (0.9 – 2.4)	2.5 (1.2 – 5.1)*	1.6 (0.7 – 3.7)
Daily Chores	20.6%	28.5%	28.5%	1.5 (1.0 – 2.3)*	1.5 (0.7 – 3.2)	1.0 (0.5 – 2.2)
Relationships	30.2%	37.5%	36.3%	1.4 (0.9 – 2.1)	1.3 (0.7 – 2.5)	1.0 (0.5 – 2.0)

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.

† Questions about specific concerns over deployment were only asked if the respondent endorsed any family concern.

N is unweighted and percentages are weighted.

Panic Attack Characteristics and Related Impairment

Individuals with panic disorder reported more cued panic attacks in the past year and more unexpected panic attacks in their lifetime than individuals with panic attacks alone. Adjusted means for panic attack characteristics and related statistical comparisons are presented in Table 4. More individuals with panic disorder reported severe impairment in each area of functioning (home, work, relationships, and social life) compared to individuals with panic attacks on the SDS. Percentages of individuals with severe impairment and related odds ratios are presented in Table 5. For the question of number of days an individual was unable to work or perform his or her normal functions a mean comparison from a linear regression was done, adjusting for sociodemographic variables and comorbid diagnoses. Individuals with panic disorder reported more days unable to work or carry our normal activities (M=32.1, SE=7.0) than individuals with panic attacks (M=17.6, SE=5.4; t=2.1, p=0.04).

Table 4: Characteristics of Panic Attacks and Related Role Impairment

	Panic Attacks Mean (SE)	**Panic Disorder** Mean (SE)	Denominator Degrees of Freedom	Statistical Comparison
Age first panic attack	24.0 (0.5)	23.6 (1.0)	500	t=-0.30, p=0.763
Number of years with at least one attack	6.0 (0.4)	7.4 (0.7)	500	t=1.82, p=0.069
Number of unexpected attacks – past-year	2.7 (1.4)	15.2 (5.9)	500	t=2.06, p=0.040
Number of unexpected attacks – lifetime	15.0 (5.0)	35.6 (6.6)	500	t=2.52, p=0.012
Number of cued attacks – past-year	4.8 (0.6)	20.0 (3.4)	500	t=4.41, p<0.001
Number of cued attacks – lifetime	12.4 (4.2)	16.6 (7.6)	500	t=0.48, p=0.629

Notes: Mean comparison used from linear regression using Wald t-tests, adjusted for sociodemographic and military variables.
N is unweighted and percentages are weighted.

Table 5: Severe Role Impairment on the Sheehan Disability Scale

	Panic Attacks[†]	**Panic Disorder**	Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables
Any Area	26.2%	57.3%	2.4 (1.2 – 4.7)*
Home	10.2%	32.1%	3.4 (1.6 – 7.3)**
Work	14.2%	40.8%	2.5 (1.0 – 6.1)*
Relationships	12.7%	35.7%	2.2 (1.1 – 4.7)*
Social Life	15.6%	37.9%	2.2 (1.1 – 4.3)*

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.
N is unweighted and percentages are weighted.
[†]Reference group is panic attacks.

Reduction of Activity, Disability, and Distress

As presented in Table 6, the majority of individuals with panic disorder had reduction of activities and high scores on the K10 distress scale and substantial proportion had two-week disability. The percentages were lower among people with panic attacks but still quite high.

The analyses presented in Table 6 were also run after removing individuals with other mental disorders in order to more effectively clarify if the results were due to comorbidity and the same pattern appeared. However, the difference between the panic disorder and no panic attack group for both reduction of activities and two-week disability did not remain significant, likely due to the small number of people who had panic disorder without another disorder.

Table 6: Reduction of Activities, Two-Week Disability, and Distress

	No Panic Attacks N = 7562	**Panic Attacks** N = 569	**Panic Disorder** N = 137	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables		
Reduction of Activities	25.6%	39.2%	51.0%	1.9 (1.5 – 2.3)**	2.5 (1.6 – 3.8)**	1.3 (0.8 – 2.0)
2-Week Disability	19.2%	26.5%	34.5%	1.4 (1.1 – 1.8)**	1.9 (1.2 – 3.0)**	1.4 (0.8 – 2.3)
High K10 Distress	8.8%	27.0%	59.0%	3.5 (2.7 – 4.4)**	11.9 (7.6 – 18.7)**	3.4 (2.1 – 5.5)**

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.
N is unweighted and percentages are weighted.

Comorbid Mental Disorders and Suicidal Ideation

Of individuals with panic disorder, 21.9% had one other mental disorder and 48.9% had two or more other disorders. For each individual disorder, and well as number of disorders, the prevalence was higher in individuals with panic attacks than without panic attacks with adjusted odds ratios ranging from 1.7 to 8.4. Percentages and odd ratios are presented in Table 7. Prevalence estimates were also higher for individuals with panic disorder then for those without panic attacks with adjusted odds ratios ranging from 3.4 to 70.4. Prevalence estimates were also significantly higher for individuals with panic disorder than for those with panic attacks, with the exception of alcohol dependence. Suicidal ideation was reported least often by individuals without panic attacks and most often by individuals with panic disorder.

Table 7: Past-Year Mental Disorders and Suicidal Ideation Associated with Panic Attacks and Panic Disorder

	No Panic Attacks N = 7562	**Panic Attacks** N = 569	**Panic Disorder** N = 137	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables		
Generalized Anxiety Disorder	0.9%	5.3%	23.0%	6.1 (3.7 – 10.1)**	30.2 (16.6 – 55.0)**	1.9 (2.5 – 9.9)**
Depression	4.7%	21.6%	53.8%	5.3 (4.0 – 7.1)**	21.8 (13.7 – 34.6)**	4.1 (2.5 – 6.8)**
Social Anxiety Disorder	1.9%	12.5%	33.3%	6.8 (4.7 – 9.9)**	22.3 (13.4 – 37.2)**	3.3 (1.8 – 5.8)**
Posttraumatic Stress Disorder	1.5%	7.7%	23.6%	4.2 (5.6 – 6.8)**	16.2 (9.4 – 28.8)**	3.8 (2.0 – 7.5)**
Alcohol Dependence	4.4%	7.5%	13.3%	1.7 (1.0 – 2.7)*	3.4 (1.7 – 6.9)**	2.0 (0.9 – 4.7)
# Disorders						
0	89.1%	64.1%	29.2%	1.0	1.0	1.0
1	8.9%	22.8%	21.9%	3.5 (2.7 – 4.5)**	7.3 (4.0 – 13.3)**	2.1 (1.1 – 4.0)*
2+	2.0%	13.2%	48.9%	8.4 (5.7 – 12.6)**	70.4 (40.4 – 122.6)**	8.4 (5.6 – 15.5)**
Suicidal Ideation	2.8%	11.3%	27.3%	3.9 (2.7 – 5.6)**	11.4 (6.5 – 19.8)**	2.9 (1.6 – 5.4)**

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.
N is unweighted and percentages are weighted.

Social Support

Data on social support scales are presented in Table 8. The percentages presented represent the proportion of respondents that indicated that type of social support frequently or always. Tangible social support was the least common form of social support that was reported frequently or always. Adequate positive social interaction and emotional or informational support were not reported as often by individuals with panic attacks and panic disorder compared to individuals without panic attacks. Compared to individuals without panic attacks, those with panic attacks reported that affectional support was less often adequate. On the other hand, a greater proportion of individuals with panic disorder reported that affectional support was adequate than those with panic attacks.

Table 8: The Medical Outcomes Study Support Survey in Relation to Panic Attacks and Panic Disorder - Support Received Frequently or Always

	No Panic Attacks N = 7562 %	**Panic Attacks** N = 569 %	**Panic Disorder** N = 137 %	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables		
Tangible	24.2%	27.4%	47.5%	0.7 (0.4 – 1.3)	1.2 (0.5 – 3.1)	1.8 (0.6 – 5.5)
Affection	87.2%	82.5%	84.9%	0.6 (0.4 – 0.9)**	0.9 (0.4 – 2.0)	1.5 (1.1 – 3.4)*
Positive Social Interaction	90.0%	83.8%	75.1%	0.5 (0.4 – 0.7)**	0.4 (0.2 – 0.6)**	0.7 (0.4 – 1.2)
Emotional or Informational	87.8%	81.9%	79.0%	0.6 (0.4 – 0.8)**	0.4 (0.2 – 0.8)**	0.7 (0.4 – 1.4)

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.
N is unweighted and percentages are weighted.

Stress Coping Scale

Looking at the three different styles of coping presented in Table 9, both self-soothing and avoidant coping strategies were used more often by individuals with panic attacks and panic disorder compared to those without panic attacks. Use of active coping strategies were not significantly different between the different panic groups.

Turning to the individual items presented in Table 10, for items from the active scale, both problem solving and looking on the bright side of things were not used as often by individuals with panic attacks and panic disorder. Looking on the bright side was used even less often by individuals with panic disorder compared to those with panic attacks. Exercise was used more often by individuals with panic attacks compared to those without panic attacks. From the self-soothing scale, all items were used more often by individuals with panic attacks and panic disorder compared to those without panic attacks except drinking alcohol, which was only significantly higher in those with panic disorder. Drug or medication use was reported more often by individuals with panic disorder than those with panic attacks. Finally, of the avoidant coping strategies, all were more common among those with panic attacks and panic disorder compared to individuals without panic attacks. Individuals were more likely to wish the situation would go away than individuals with panic attacks.

Table 9: The Stress Coping Scales and Relation to Past-Year Panic Attacks and Panic Disorder

	No Panic Attacks Mean (SE)	**Panic Attacks** Mean (SE)	**Panic Disorder** Mean (SE)	Statistical Comparison: Regressions Adjusted for Sociodemographic and Military Variables		
				Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
Active	16.5 (0.03)	16.4 (0.11)	16.02 (0.25)	t=-0.34, *p*=0.738	t=-1.82, *p*=0.070	t=-1.56, *p*=0.121
Self-Soothing	5.8 (0.02)	6.7 (0.10)	7.4 (0.21)	t=8.84, *p*<0.001	t=7.69, *p*<0.001	t=3.03, *p*=0.003
Avoidant	10.7 (0.04)	12.3 (0.13)	13.3 (0.24)	t=11.38, *p*<0.001	t=10.38, *p*<0.001	t=3.83, *p*<0.001

Table 10: The Stress Coping Scale Individual Items and Panic Attacks and Panic Disorder - Coping Strategy Used Often

	No Panic Attacks N = 7562	**Panic Attacks** N = 569	**Panic Disorder** N = 137	Panic Attacks (Reference – No Panic Attacks)	Panic Disorder (Reference – No Panic Attacks)	Panic Disorder (Reference – Panic Attacks)
				Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables		
Active						
Problem Solving	85.4%	80.0%	76.7%	0.7 (0.5 – 0.9)*	0.5 (0.3 – 0.8)**	0.9 (0.7 – 1.2)
Talking to Others	40.6%	40.1%	44.8%	1.0 (0.8 – 1.2)	1.1 (0.7 – 1.7)	1.1 (0.7 – 1.8)
Exercise	28.7%	33.2%	37.0%	1.3 (1.0 – 1.6)*	1.5 (0.9 – 2.3)	1.2 (0.7 – 2.0)
Do Something Enjoyable	45.6%	44.2%	38.3%	0.9 (0.8 – 1.1)	0.7 (0.5 – 1.0)	0.8 (0.5 – 1.2)
Look on Bright Side	60.0%	50.7%	33.9%	0.7 (0.6 – 0.9)**	0.4 (0.2 – 0.5)**	0.5 (0.2 – 0.8)**
Self-Soothing						
Smoking More	7.2%	15.9%	16.8%	2.2 (1.6 – 3.0)**	2.1 (1.2 – 3.7)**	1.0 (0.5 – 1.8)
Drinking Alcohol	1.3%	2.9%	5.8%	1.9 (0.9 – 3.7)	3.6 (1.3 – 9.6)*	1.9 (0.6 – 6.2)
Using Drugs/ Medication	0.5%	2.4%	10.1%	3.9 (1.7 – 8.8)**	15.7 (6.4 – 38.1)**	4.0 (1.4-11.7)*
Praying/Spiritual	8.0%	12.6%	14.4%	1.7 (1.2 – 2.3)**	2.0 (1.1 – 3.7)*	1.2 (0.6 – 2.5)
Avoidant						
Avoiding People	5.1%	10.8%	15.9%	2.1 (1.4 – 3.0)**	2.9 (1.7-5.0)**	1.4 (0.8 – 2.6)
Sleeping More	2.9%	5.4%	8.6%	1.7 (1.1 – 2.8)*	3.4 (1.8 – 6.6)**	2.0 (0.9 – 4.2)
Eating More/less	4.6%	9.7%	15.3%	1.9 (1.4 – 2.6)**	3.2 (1.8 – 5.6)**	1.7 (0.9 – 3.1)
Blame Oneself	8.9%	19.5%	26.4%	2.3 (1.8 – 3.0)**	3.5 (2.3 – 5.3)**	1.5 (0.9 – 2.5)
Wish Situation Would go Away	34.8%	51.1%	73.3%	1.4 (1.6 – 2.4)**	4.7 (2.9 – 7.5)**	2.4 (1.5 – 3.9)**

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.

Perceived Need and Mental Health Service Use

The vast majority of individuals with panic disorder (90%) had a self-perceived need for mental health care and three-quarters had sought mental health care. Percentages and odds ratios for perceived need and service use are presented in Table 11. The percentages for perceived need and service use were significantly lower than those for individuals with panic disorder after adjusting for sociodemographic and military variables. However, after adjusting for other mental disorders the odds ratios dropped considerably with service use no longer being significant. Of those individuals who used mental health services, the most common professional that care was sought from in the panic disorder group was a family doctor or general practitioner (65.7%) and in the treatment specifically for panic attacks. Individuals with panic attacks that had consulted a professional, consulted on average 2 (SE 0.4) professionals. The number of professionals consulted was not significantly different for individuals with panic disorder ($t=0.75$, $df=500$, $p=0.5$) with these individuals reporting 3 (SE 0.4) professionals consulted on average. These means are adjusted for sociodemographic and military variables as well as comorbid disorders. Individuals without panic attacks were not included due to small cell sizes.

The previous analyses examining perceived need and service use were also done comparing regular and reserve populations among individuals with panic disorder because of differences in the health care systems. There were no significant differences between these populations for any variable assessed.

Table 11: Comparison of Respondents with Panic Attacks and Panic Disorder on Perceived Need for Mental Health Care and Use of Mental Health Services

	Panic Attacks†	**Panic Disorder**	Model 2: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables	Model 3: Odds Ratios (95% CI) from Multivariate Logistic Regressions Adjusted for Sociodemographic and Military Variables and Comorbid Disorders
Perceived Need	46.3%	89.6%	9.8 (5.5 – 17.6)**	2.2 (1.1 – 4.1)*
Service Use	32.5%	74.5%	5.7 (3.4 – 9.4)**	1.3 (0.7 – 2.3)
Perceived Need or Service Use	51.3%	89.9%	8.3 (4.6 – 15.2)**	1.8 (0.9 – 3.5)
Treatment for Panic Attacks				
Consulted Professional	43.4%	80.4%	6.2 (3.1 – 12.2)**	3.8 (1.8 – 8.2)**
If Consulted Professional‡				
Received Effective Treatment	66.1%	66.5%	1.1 (0.5 – 2.3)	1.2 (0.5 – 3.1)
Received Treatment in Past Year	55.4%	86.1%	5.3 (1.7 – 15.8)**	3.0 (0.9 – 10.4)

Notes: * $p < 0.05$. ** $p < 0.01$. CI = confidence interval.
†Reference group is panic attacks.
‡The questions in the last two rows were only asked of respondents that answered yes to consulted professional about panic attacks.

Discussion

Although much of the focus on mental health in the military has been on posttraumatic stress disorder, panic attacks and panic disorder were relatively common in the military population with past-year prevalence estimates of 7.0% and 1.8%, respectively. These percentages reflect approximately 15, 392 military personnel in 2002 with panic attacks and 2592 with panic disorder.

Panic attacks and panic disorder in the Canadian military were associated with similar sociodemographic variables as in the general population including being female, having less education, and being separated, widowed, or divorced (Kinley et al., 2009; Goodwin, Stayner, & Davidson, 2001). Associations with military variables are also consistent with previous research on mental disorders in the military, such as being of regular status (opposed to reserve), having lower rank, combat experience, and witnessing atrocities (Black et al., 2004; Bartone et al., 1998; Litz et al., 1997). Variables related to deployments such as time away from home, time between deployments, and family concern over deployment were not strongly associated with panic attacks or panic disorder.

The majority of individuals with panic disorder (71%) and a substantial portion of those with panic attacks (36%) had at least one other mental disorder, the most common being depression. This high level of comorbidity is higher compared to the general population (Kinley et al., 2009) and consistent with the observations of a clinician working with the Canadian military population in Manitoba (J. Laforce, personal communication, May 6, 2009). Comorbidity alone can be a huge burden and greatly increases health care utilization (Jacobi et al., 2004). Suicidal ideation was also more

common among those with panic attacks and panic disorder. This finding is consistent with the literature on panic attacks and panic disorder in the general population as well (Goodwin et al., 2001; Goodwin, Hamilton, Milne, & Pine, 2002; Goodwin & Roy-Byrne, 2006; Kinley et al., 2009). Suicide is an important issue in the military, and the US army was at a 28-year high in 2008 for suicide rates (Kuehn, 2009). There has been an upward trend in deaths due to suicide in this population since 2004. Panic attacks or panic disorder could be a marker for health care providers to inquire about suicidal ideation.

With the higher prevalence of mental disorders and suicidal ideation, it is not surprising that individuals with panic attacks and panic disorder have more reduction of activities, two-week disability, and high K10 distress scores than individuals without panic attacks. These findings are again, consistent with those from the general population (Kinley et al., 2009).

Potential protective factors such as social support and active coping strategies were less common in both individuals with panic attacks and panic disorder compared to those without panic attacks. Specifically for social support, more limited availability of positive social interaction and emotional or informational support was reported. Less affection was also reported by those with panic attacks. The reduced availability of these types of support could be related to the social withdrawal that is often seen with anxiety, but could also likely make coping with and overcoming the anxiety more difficult. Tangible support was the only type that increased from no panic attacks to panic attacks to panic disorder. This seems consistent with findings that panic attacks and panic disorder are related to increased financial dependency. The coping strategies used often

by individuals with panic attacks and panic disorder may also make dealing with the anxiety more difficult. Self-soothing and avoidant strategies were used more frequently among these groups and some specific active strategies were used less often. Fortunately, many of the coping strategies (such as problem solving) are used often by all of the groups suggesting a receptiveness of many persons to effective management approaches.

Comorbidity, reduced activities, distress, and disability as well as limited social support likely contribute to the prevalence of perceived need and mental health service use. Approximately 90% of individuals with panic disorder and 46% of individuals with panic attacks perceived a need for mental health care. In comparison, the prevalence of perceived need in the CCHS-CFS for anyone with any past-year mental disorder was 60% (Sareen et al., 2007), and in the Australian general population it was 61% (Meadows et al., 2002). Consistent with previous studies, panic disorder has higher rates of perceived need than mental disorders in general, and even though the panic attack group did not meet the full criteria for panic disorder, the prevalence of perceived need is not much lower than that of mental disorders in general. This finding may be due to the very physical nature of the panic attacks, with many individuals likely thinking that they are having a heart attack or a real medical condition.

Both panic attacks and panic disorder are associated with negative outcomes such as comorbidity, distress, and role impairment, but how do they compare with each other? Individuals with panic disorder are older and of lower rank, have more unexpected and cued panic attacks in the past-year, have more severe role impairment in every area of their lives, a higher odds of having a comorbid mental disorder and suicidal ideation,

more distress, are more likely to perceive a need for mental health care, and are more likely to have consulted a professional about their panic attacks.

The findings of this study generally support the view that those with panic attacks alone experience significant interference in functioning even though they do not meet full criteria for the disorder (Katerndahl & Realini, 1997). Some of the individuals with panic attacks may meet criteria for panic disorder in the future. If they receive appropriate treatments in the early stages, it might be possible to prevent some of the negative outcomes associated with panic disorder and comorbid conditions. There has been some preliminary support for this possibility in the general population. In a cross-sectional study, Goodwin and Olfsen (2001) reported that individuals treated for panic attacks were less likely to have major depression than individuals who had panic attacks that were not treated. There has also been evidence that treatment for panic in a military population is effective in terms of panic attacks, panic-related worry, and phobic avoidance (Schmidt, Staab, Trakowski, & Sammons, 1997). To provide early treatment would require early detection. Detection of panic disorder should be possible, with 90% of people with the disorder reporting a perceived need for mental health care or service use and 80% consulting a health care professional about their panic attacks. The majority of the individuals that used mental health services (66%) did so from a general practitioner. The high rate of perceived need in persons with panic attacks and panic disorder compared to other disorders (Meadows et al., 2002) make panic attacks an important condition for general practitioners and other health care professionals to be aware of and to use as a possible marker for other mental health problems. The panic may be the problem that gets an individual to seek help but could provide an opportunity to screen for other mental

disorders and risk for suicidal behaviours. Perceived need for mental health care and consultation with a health care professional about the attacks was lower for individuals with panic attacks (46% and 43% respectively), but is still a substantial proportion of this population and detection and treatment of these individuals could reduce future progression to panic disorder and other mental disorder comorbidity. Early detection should be especially likely in the military where individuals have regularly scheduled medical check ups and access to services right on base (J. Laforce, Personal Communication, May 6, 2009). More longitudinal studies on the consequences of panic attacks and panic disorder are necessary to clarify the nature of relationships and how effective treatment would be for the associated mental health problems.

Panic disorder has very high costs in terms of health care that may be reduced with increased prevention efforts (Klerman et al., 1991; Markowitz et al., 1989). Hopefully this research will kindle new interest in exploring the consequences of panic in the military. Future research in this area should include longitudinal studies and focus on the interactions between combat experience and other variables in predicting panic attacks and panic disorder.

The results should be interpreted within the context of several limitations. The CCHS-CFS uses a cross-sectional design, which allows researchers to establish associations between variables but not to make conclusions regarding causality. Trained lay interviewers administered the interview rather than professional clinicians, which may lead to an under- or overestimation of the prevalence of these disorders. Axis II disorders were not assessed and there were a number of Axis I disorders such as obsessive-compulsive disorder, dysthymia, agoraphobia, alcohol abuse, and substance use disorders

that were not included in the survey. These disorders may account for some of the impairment related to panic disorder and panic attacks. However, there have been other studies looking at panic attacks that were able to adjust for a greater number of disorders, and the presence of other disorders did not account for the results. For example, Goodwin and colleagues (2003) adjusted for more disorders than those assessed in the CCHS-CFS, including obsessive-compulsive disorder, specific phobia, overanxious disorder, and dysthymia, and still found that the likelihood of having severe asthma increased with every panic symptom. The Sheehan Disability Scale questions were only asked with individuals who endorsed at least one unexpected panic attack, limiting the ability to compare the level of disability with the group with no panic attacks. There was also an absence of assessment of important anxiety concepts such as anxiety sensitivity and sense of control that would have been valuable to look at.

Another limitation of the study is that the CCHS-CFS was conducted in 2002, when the majority of deployments were for peacekeeping missions with lower levels of combat intensity than seen in Afghanistan, for example. Peacekeeping has different stresses and benefits than combat focused deployments (Bartone et al., 1998; Litz et al., 1997; Shigemura & Nomura, 2002). Peacekeeping missions may include some exposure to combat, exposure to atrocities focused on civilians, and feelings of frustration and powerless in having to refrain from using force on dangerous missions. However, peacekeeping can also provide a great deal of gratification and fulfillment in providing aid to those in need and pride in serving their country. Finally, information on the location of the participants' deployments was not available, but the operations that occurred at the time can provide information on possible deployment experiences of the

respondents. Operations prior to the time of the survey include Iraq in the first Gulf war, Rwanda, Somalia, and the former Yugoslavia. If this survey were repeated today Canadian forces would have much more exposure to combat and casualties among members than in previous peacekeeping deployments. This makes an understanding of the common mental health problems experienced in the military even more important.

Conclusions

In conclusion, this study provides preliminary data to suggest that panic attacks and panic disorder have an independent association with other mental disorders, disability, and perceived need for mental health care. Early detection and treatment for panic may help reduce some of these negative outcomes.

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